***Response to Arguments***

1. Applicant's arguments, see Remarks filed 3/17/2009 with respect to the rejection(s) of claim(s) 1 under 35 USC 103 (a) have been fully considered and are persuasive. Therefore, the rejection has been withdrawn. However, upon further consideration, a new ground(s) of rejection is made in view of Hjelm et al. (US 6647067).

***Claim Rejections - 35 USC § 103***

2. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

> (a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negatived by the manner in which the invention was made.

3. Claim 1 - 3, 6, 7, 10, 11, 14, 22 - 24 , 41, 43 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (U.S. Pub. No. 2004/0052236) in view of Foschini et al. (US 20030104808) and further in view of Hjelm et al. (US 6647067).

Claims 1, 22, Hwang discloses:

• obtaining first data to be delivered to multiple user devices via a common channel ([0150], lines 1-4, 43-48);

• obtaining second data to be delivered to a specific user device via a dedicated channel ([0150], lines 1-4, 43-48);

• acquiring channel information for a common channel between a transmitter and said specific user device ([0153], lines 16-22);

• and generating a transmit signal for said specific user device using said first data, said second data, said transmit signal to be transmitted from said transmitter to said specific user device via a dedicated channel ([0149], lines 1-6, [0150], lines 43-48, 54-55. Also see Response to Arguments (a) above).

Hwang does not disclose that the transmit signal is generated using the channel information, an interference component and subtracting out the interference component.

In the same field of endeavor, however, Foschini discloses the transmit signal is generated using the channel information ([0027]). Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Foschini, in the system of Hwang because this would enable the interference to be precompensated for, thereby increasing system capacity, as disclosed by Foschini ([0003]).

In the same field of endeavor, however, Hjelm discloses determining a common channel interference component and a difference between the common channel interference component and the second data (Abstract; column 3, lines 2- 4, 17 – 23; column 6, lines 8 - 11). Hjelm disclose subtracting out the interference on the receiver side.

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the same concept (of subtracting out the interference) on

the transmitter side, because this would enable the interference to be removed at the transmitter, thereby improving the receiver performance.

Claims 2, 23, Hwang further discloses acquiring channel information for a dedicated channel between said transmitter and said specific user device before generating said transmit signal, wherein generating said transmit signal includes using said channel information for said dedicated channel ([0149], [0150]).

Claims 3, 24, Hwang further discloses said transmit signal is configured so that common channel interference will be at least partially cancelled within said specific user device after reception therein ([0153]).

Claim 6, Hwang further discloses acquiring channel information includes receiving channel information from said specific user device ([0153], lines 16-22).

Claim 7, Hwang further discloses said transmitter is part of a base station in a cellular CDMA system (abstract, line 3); and said first data includes data to be broadcast as part of a pilot signal ([0010]).

Claim 10, Hwang further discloses generating a transmit signal includes determining a common channel interference component that would be output by a receiver of said specific user device as a result of transmitting said first data from said transmitter into said common channel without using interference mitigation ([0153], lines 16-22).

Claim 11, Hwang further discloses determining a common channel interference component includes determining an effect of the common channel, as given by said channel information, on said first data ([0153], lines 16-22).

Claim 14, Hwang further discloses transmitting said transmit signal from said transmitter ([0068].

Claim 41 limitations are analyzed similar to those in claim 1, with the common channel information being the midamble sequence that is transmitted on both the common and dedicated channels. The mitigation of channel interference is done as disclosed by Foschini.

Claim 43, is analyzed similar to limitations in claim 1, where the channel information is obtained and used on the transmitter side, as disclosed by Foschini.

4. Claim 27 - 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (U.S. Pub. No. 2004/0052236) in view of Foschini et al. (US 20030104808) and furthering view of Rasanen et al. (US 5,956,332) and Hjelm et al. (US 6647067).

Claim 27, Hwang discloses:

• obtaining first data to be delivered to user devices associated with a first class via corresponding dedicated channels ([0150], lines 1-4; Fig. 16, user data 1601; wherein the first data is interpreted as the input data to one of the dedicated channels);

• obtaining second data to be delivered to user devices associated with a second class via corresponding dedicated channels([0150], lines 1-4; Fig. 16, user data 1601; wherein the second data is interpreted as the input data to another one of the dedicated channels);

• acquiring channel information from user devices associated with said second class ([0153], lines 16-22);

generating transmit signals to be transmitted to user devices associated with said first class without using dirty paper techniques (Fig. 16; where no pre equalization is used on the dedicated channel that transmits the first data);

• generating transmit signals to be transmitted to user devices associated with said second class using said second data ([0149], lines 1-6, [0150], lines 43-48, 54-55).

Hwang does not disclose combining the first and second data and using dirty paper techniques.

Hwang does not disclose that the transmit signal for the second class is generated using dirty paper techniques.

In the same field of endeavor, however, Foschini discloses the transmit signal is generated using dirty paper cancellation techniques ([0027], [0006]).

Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Foschini, in the system of

Hwang for the channel associated with the second class because this would enable the interference to be precompensated for, thereby increasing system capacity, as disclosed by Foschini ([0003]).

Rasanen discloses combining first data and second data (Fig. 7B, element 68). Rasanen discloses this on the receiver side but one having ordinary skill in the art, can easily use the data combiner on the transmitter side, to send both the first data and second data to the user devices associated with the second class, rather than only the second data to the user devices associated with the second class.

In the same field of endeavor, however, Hjelm discloses determining a common channel interference component and a difference between the common channel interference component and the second data (Abstract; column 3, lines 2- 4, 17 – 23; column 6, lines 8 - 11). Hjelm disclose subtracting out the interference on the receiver side.

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the same concept (of subtracting out the interference) on the transmitter side, because this would enable the interference to be removed at the transmitter, thereby improving the receiver performance.

Claim 28, Hwang does not disclose that the user equipment in his invention includes user devices that do not use dirty paper cancellation techniques.

Claims 29, 30, Hwang fails to disclose using dirty paper cancellation techniques, however, Foschini discloses generating a transmit signal includes using dirty paper

cancellation techniques ([0006]). Foschini further discloses the use of these techniques reduces the computational burden of interference cancellation ([0006]). Because of this advantage, it would have been obvious to one skilled in the art at the time of invention to incorporate the dirty paper cancellation as disclosed by Foschini into .the invention of Hwang.

Claims 31, 32, Hwang fails to disclose generating transmit signals includes generating signals that are configured to cancel interference caused by signals transmitted to user devices, however, Foschini discloses generating transmit signals includes generating signals that are configured to cancel interference caused by signals transmitted to user devices ([0006]). Because interference cancellation in the transmit signal generation will improve signal efficiency and accuracy, it would have been obvious to one skilled in the art at the time of invention to incorporate the interference cancellation as disclosed by Foschini into the invention of Hwang. 11.

5. Claims 15 – 17, 19, 20, and 35-37 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fitton (U.S. Pub. No. 2004/0028121) in view of Foschini et al. (US 20030104808) and further in view of Hjelm et al. (US 6647067).

Claims 15, 19, Fitton discloses: In the same field of endeavor, however, Hjelm discloses determining a common channel interference component and a difference between the common channel interference component and the second data (Abstract; column 3,

lines 2- 4, 17 – 23; column 6, lines 8 - 11). Hjelm disclose subtracting out the interference on the receiver side.

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the same concept (of subtracting out the interference) on the transmitter side, because this would enable the interference to be removed at the transmitter, thereby improving the receiver performance.

• at least one dipole antenna ([0038], line 5)

• a common channel interference unit to determine a common channel interference component associated with a remote user device ([0081], lines 3-6)

• generating a transmit signal to be transmitted to said remote user device via a dedicated channel, said transmit signal generator using said dedicated data to generate said transmit signal ([0013], lines 4-5, [0091], lines 1-3).

• a transmit signal transmitted using said at least one dipole antenna ([0038], line 5).

Fitton does not disclose that the transmit signal is generated using the channel information. In the same field of endeavor, however, Foschini discloses the transmit signal is generated using the common channel interference component ([0027]). Therefore it would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the method, as taught by Foschini, in the system of

Fitton because this would enable the interference to be precompensated for, thereby increasing system capacity, as disclosed by Foschini ([0003]).

In the same field of endeavor, however, Hjelm discloses determining a common channel interference component and a difference between the common channel interference component and the second data (Abstract; column 3, lines 2- 4, 17 – 23; column 6, lines 8 - 11). Hjelm disclose subtracting out the interference on the receiver side.

It would have been obvious to one having ordinary skill in the art, at the time the invention was made, to use the same concept (of subtracting out the interference) on the transmitter side, because this would enable the interference to be removed at the transmitter, thereby improving the receiver performance.

Claims 16,.20, said common channel interference unit determines said common channel interference component using known common channel transmit data and corresponding channel information (Fitton [0087], line 2).

Re Claim 35, Fitton discloses:

• an interference unit to collect data to be delivered to user devices within a first class via corresponding dedicated channels and to use the collected data to generate a composite interference signal ([0081], lines 3-6);
• a transmit signal generator to generate transmit signals to be transmitted to user devices associated with said first class without using dirty paper techniques.

Fitton does not disclose using dirty paper techniques.

However, Foschini discloses within a second class via corresponding dedicated channels, said transmit signal generator using said composite interference signal, dedicated data to be delivered to said user devices within said second class, and channel information associated with said user devices within said second class ([0013], lines 4-5, [0091], lines 1-3, [0087], line 2).

Therefore, it would be obvious to one of ordinary skill in the art to use the dirty paper technique disclosed by Foschini in the system of Fitton, so that the combined system could transmit to a first and a second class of devices.

All other limitations of claim 35 are as analyzed in claim 15 above.

Claim 36, Fitton does not disclose that the user equipment in his invention includes user devices that do not use dirty paper cancellation techniques.

Claims 17, 37, 38 Fitton fails to disclose using dirty paper cancellation techniques. However, Foschini discloses generating a transmit signal includes using dirty paper cancellation techniques ([0006]). Foschini further discloses the use of these techniques reduces the computational burden of interference cancellation ([0006]). Because of this advantage, it would have been obvious to one skilled in the art at the time of invention to incorporate the dirty paper cancellation as disclosed by Foschini into the invention of Fitton.

6. Claim 8 rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (U.S. Pub. No. 2004/0052236) in view of Nishio et al. (U.S. Pub. No. 2006/0166690).

Claim 8, Hwang discloses said transmitter is part of a base station in a cellular CDMA system (abstract, lines 1-3). Hwang fails to disclose data to be broadcast as part of a paging signal, however, Nishio discloses data to be broadcast as part of a paging signal ([0005], lines 6-7). Because Nishio discloses this signaling method has an advantage of more efficient power control ([0008]), it would have been obvious to one skilled in the art at the time of invention to incorporate the paging as disclosed by Nishio into the invention of Hwang.

7. Claims 9, 25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (U.S. Pub. No. 2004/0052236) as applied to claims 1 and 22 above, and further in view of Foschini et al. (U.S. Pub. No. 2003/0104808).

Claims 9, 25 Hwang fails to disclose using dirty paper cancellation techniques, however, Foschini discloses generating a transmit signal includes using dirty paper cancellation techniques ([0006]). Foschino further discloses the use of these techniques reduces the computational burden of interference cancellation ([0006]). Because of this advantage, it would have been obvious to one skilled in the art at the time of invention to incorporate the dirty paper cancellation as disclosed by Foschini into .the invention of Hwang.

8. Claims 13, 26 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (U.S. Pub. No. 2004/0052236) in view of Shany et al. (U.S. Pub. No. 2004/0030979) and furthering view of Foschini et al. (U.S. Pub. No. 2003/0104808).

Claims 13, 26 Hwang fails to disclose generating a transmit signal includes performing a modulo lattice operation, however, Shany discloses generating a transmit signal includes performing a modulo lattice operation ([0001]). Because modulo lattice operations have computation advantages in the performing of interference canceling, it would have been obvious to one skilled in the art at the time of invention to incorporate the modulo lattice as disclosed by Shany into the invention as disclosed by Hwang.

9. Claims 18, 21, 39 and 42 are rejected under 35 U.S.C. 103(a) as being unpatentable over Fitton (U.S. Pub. No. 2004/0028121) in view of Shany et al. (U.S. Pub. No. 2004/0030979) and further in view of Foschini et al. (U.S. Pub. No. 2003/0104808).

Claims 18, 21, 39, 42, Fitton fails to disclose generating a transmit signal includes performing a modulo lattice operation, however, Shany discloses generating a transmit signal includes performing a modulo lattice operation ([0001]). Because modulo lattice operations have computation advantages in the performing of interference canceling, it would have been obvious to one skilled in the art at the time of invention to incorporate the modulo lattice as disclosed by Shany into the invention as disclosed by Fitton.

10. Claims 4, 5, 31 and 32 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (U.S. Pub. No. 2004/0052236) as applied to claims 1 and 27 above, and further in view of Fitton (U.S. Pub. No. 2004/0028121)

Claims 4, Hwang discloses use within a code division multiple access (CDMA) based system. Hwang fails to disclose said common channel interference will be at least partially cancelled at the chip level, however, Fitton discloses said common channel interference will be at least partially cancelled at the chip level ([0013], lines 4-5, [0091], lines 1-3, [0087], line 2). Because interference cancellation in the transmit signal generation will improve signal efficiency and accuracy, it would have been obvious to one skilled in the art at the time of invention to incorporate the interference cancellation as disclosed by Fitton into the invention of Hwang.

Claim 5, Hwang discloses use within a code division multiple access (CDMA) based system. Hwang fails to disclose said common channel interference will be at least partially cancelled at the symbol level, however, Fitton discloses common channel interference will be at least partially cancelled at the symbol level ([0013], lines 4-5, [0091]i lines 1-3, [0087], line 2). Because interference cancellation in the transmit signal generation will improve signal efficiency and accuracy, it would have been obvious to one skilled in the art at the time of invention to incorporate the interference cancellation as disclosed by Fitton into the invention of Hwang.

11. Claim 33 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (U.S. Pub. No. 200410052236) as applied to claim 27 above, and further in view of Ben-David (U.S. Pub. No. 200410101034).

Claim 33, Hwang fails to disclose the transmit signal generator includes matrix decomposition functionality for decomposing a channel matrix into a unitary matrix and a triangular matrix, however, Ben-David discloses matrix decomposition functionality for decomposing a channel matrix into a unitary matrix and a triangular matrix ([0034]). Decomposing a matrix into triangular and unitary components makes the solving and manipulation of matrix equations much easier. Because of this advantage, it would have been obvious to one skilled in the art at the time of invention to incorporate the decomposition as disclosed by Ben-David into the invention of Hwang

12. Claims 34 is rejected under 35 U.S.C. 103(a) as being unpatentable over Hwang et al. (U.S. Pub. No. 2004/0052236) as applied to claim 27 above and further in view of Shany et al. (U.S. Pub. No. 2004/0030979).

Claims 34 Hwang fails to disclose generating a transmit signal includes performing a modulo lattice operation, however, Shany discloses generating a transmit signal includes performing a modulo lattice operation ([0001]). Because modulo lattice operations have computation advantages in the performing of interference canceling, it would have been obvious to one skilled in the art at the time of invention to incorporate the modulo lattice as disclosed by Shany into the invention as disclosed by Hwang.

13. Claim 40 is rejected under 35 U.S.C. 103(a) as being unpatentable over Fitton (U.SI Pub. No. 2004/0028121) as applied to claim 35 above, and further in view of Ben-David (U.S. Pub. No. 2004/0101034).

Claim 40, Fitton fails to disclose the transmit signal generator includes matrix decomposition functionality for decomposing a channel matrix into a unitary matrix and a triangular matrix, however, Ben-David discloses matrix decomposition functionality for decomposing a channel matrix into a unitary matrix and a triangular matrix ([0034]). Decomposing a matrix into triangular and unitary components makes the solving and manipulation of matrix equations much easier. Because of this advantage, it would have been obvious to one skilled in the art at the time of invention to incorporate the decomposition as disclosed by Ben-David into the invention of Fitton.

***Contact Information***

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to ADOLF DSOUZA whose telephone number is (571)272-1043. The examiner can normally be reached on Monday through Friday from 8:00 AM to 5:00 PM EST.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, David Payne can be reached on 571-272-3024. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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